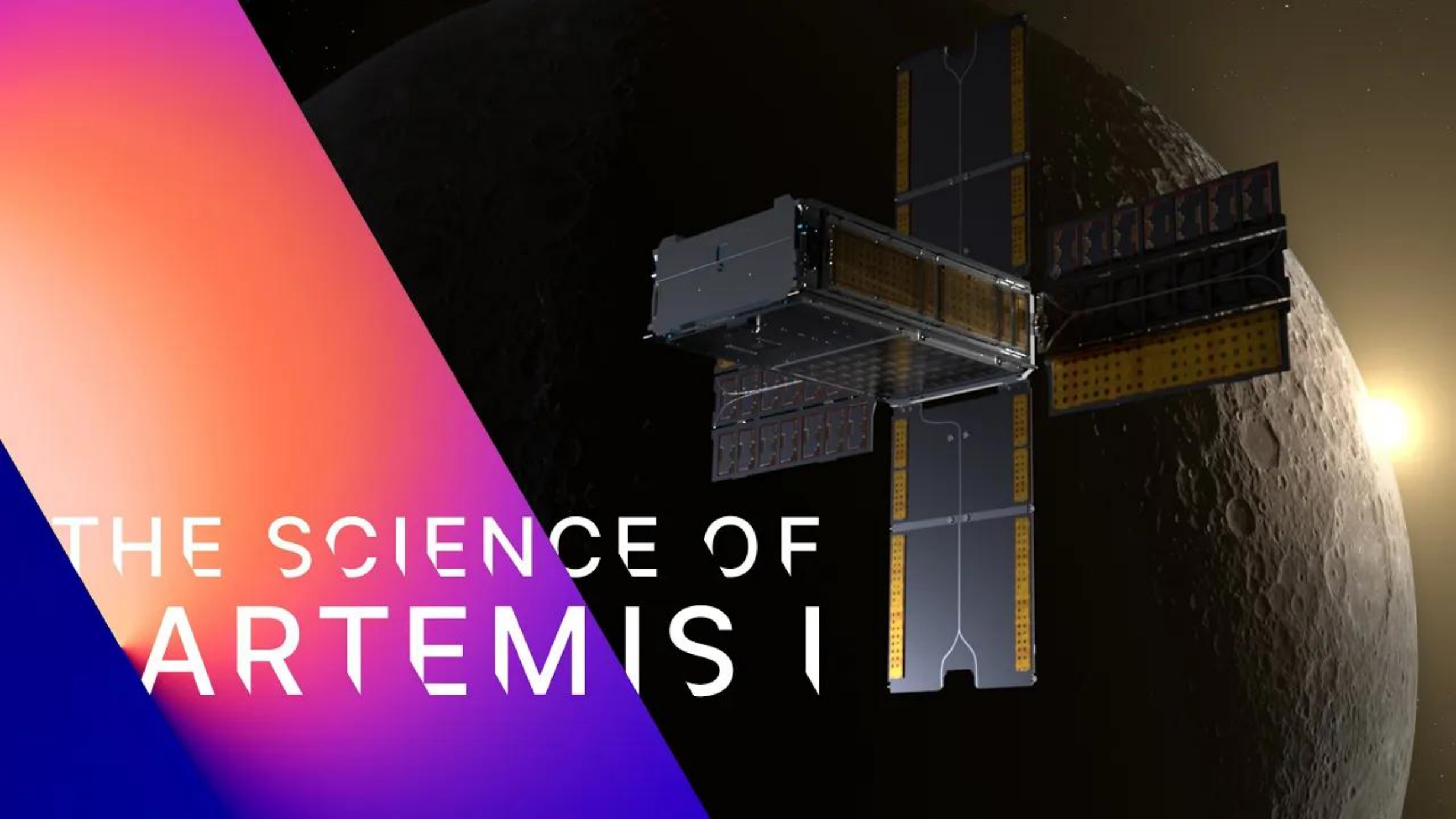
THE SCIENCE OF
ARTEMIS I

1
00:00:00,560 --> 00:00:05,520
Artemis I is paving the way for us to\h
explore deeper and deeper into space.

2
00:00:05,835 --> 00:00:09,630
I think Artemis I is significant on so many levels.

3
00:00:09,630 --> 00:00:13,082
It is a new frontier to do science.

4
00:00:13,082 --> 00:00:18,000
So the primary objective is to test the Orion spacecraft integrated with the Space Launch System.

5
00:00:18,000 --> 00:00:23,267
And it is designed to carry out the boldest of the bold missions.

6
00:00:23,267 --> 00:00:25,850
But it's more than just learning how to travel in space.

7
00:00:25,850 --> 00:00:30,000
We're taking a lot of cool science along with us on this first mission to the Moon.

8
00:00:30,000 --> 00:00:34,776
So as NASA plans to go back to the surface of the Moon and then on to Mars,

9
00:00:35,007 --> 00:00:37,836
we want to spend more time there and that's riskier business.

10
00:00:37,836 --> 00:00:43,891
So the more we learn about the Moon itself and the environment where we'll be operating, the better we can pr

11
00:00:43,891 --> 00:00:49,941
We have 10 CubeSats, we call secondary payloads, which are small scientific spacecraft of their own,

12
00:00:49,941 --> 00:00:52,680
that will each be conducting their own scientific mission.

13

00:00:53,001 --> 00:00:57,801
All of these payloads, in some form or fashion, will help us going forward.

14
00:00:57,801 --> 00:01:00,244
They are going to be studying the Moon.

15
00:01:00,244 --> 00:01:02,994
And they're going to help us understand, what is the Moon made out of?

16
00:01:02,994 --> 00:01:06,888
What types of rocks? What types of regolith? What types of ice?

17
00:01:06,888 --> 00:01:09,442
What's mixed in with water that might be present?

18
00:01:09,442 --> 00:01:14,133
One of them is actually going to attempt to land on the Moon. They're going to be studying the Sun.

19
00:01:14,133 --> 00:01:17,786
Understanding and studying the space environment or the space weather.

20
00:01:17,786 --> 00:01:20,207
Some different propulsion systems.

21
00:01:20,207 --> 00:01:27,575
These novel ideas will ultimately turn into the technology and the systems that we want to use going forward.

22
00:01:27,575 --> 00:01:32,135
There's a lot of cool things going on between all these CubeSats that make up our secondary payloads.

23
00:01:32,135 --> 00:01:37,172
Additionally, inside the Orion we'll be flying an experiment to study space biology.

24
00:01:37,172 --> 00:01:48,000
Space biology is where we study the underlying changes that Earth-based biological systems undergo when th

25
00:01:48,000 --> 00:01:51,363
Or basically how does life respond to the space environment?

26
00:01:51,363 --> 00:01:56,055
The level of ionizing radiation that you experience when you go beyond the Van Allen belt,

27
00:01:56,055 --> 00:02:00,973
so you go beyond the protective magnetic sphere that we have around us,

28
00:02:00,973 --> 00:02:05,434
you then get exposed to higher levels of ionizing radiation.

29
00:02:05,434 --> 00:02:09,016
So we are flying several space biology experiments.

30
00:02:09,016 --> 00:02:11,393
We'll take a series of materials —

31
00:02:11,393 --> 00:02:12,006
plant seeds,

32
00:02:12,006 --> 00:02:12,582
fungi,

33
00:02:12,686 --> 00:02:14,000
the yeast cell,

34
00:02:14,000 --> 00:02:14,500
algae,

35
00:02:14,998 --> 00:02:21,134
and ride along the trip. And then when it comes home we can analyze how they responded to that environmen

36
00:02:21,134 --> 00:02:28,075
This research will help us thrive in space. It will help us to go further and stay there longer.

37
00:02:28,075 --> 00:02:34,522
In addition to space biology, we'll be learning about how to make astronauts more effective in the Orion in the f

38

00:02:34,522 --> 00:02:38,801
An example of that is something called the Callisto technology demonstration.

39
00:02:38,801 --> 00:02:41,651
Lockheed Martin built the Orion spacecraft for NASA.

40
00:02:41,651 --> 00:02:46,075
And we'll be flying a secondary payload that's a demonstration payload called Callisto.

41
00:02:46,075 --> 00:02:51,747
So we took the technology from Amazon for Alexa and the WebEx technology from Cisco

42
00:02:51,747 --> 00:02:56,977
and so we built a digital assistant, if you will, a custom space-qualified Alexa.

43
00:02:57,081 --> 00:03:00,617
Alexa, how does the life support system work?

44
00:03:00,617 --> 00:03:05,695
Orion's life support system is the Environmental Control and Life Support System, or ECLS.

45
00:03:05,822 --> 00:03:10,671
And so this payload is the demonstration mission to show how astronauts in the future

46
00:03:10,671 --> 00:03:14,530
could use this technology as an innovative user interface.

47
00:03:14,530 --> 00:03:18,285
So there you have it. I hope you agree with me, this is exciting.

48
00:03:18,285 --> 00:03:22,416
I am just over the Moon excited for the Artemis I launch.

49
00:03:22,416 --> 00:03:26,375
The science we'll conduct on Artemis I lays the groundwork

50
00:03:26,375 --> 00:03:32,000
to ensure that we can safely conduct scientific activities at the Moon with our astronauts going forward.

51
00:03:32,068 --> 00:03:37,396
This really is the stepping stone for us as we take that next giant leap in space exploration.